Effect of Amphetamines on Speech Defects In the Mentally Retarded

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• **In a double-blind study, 106 mentally retarded patients with speech defects were given 15 mg. of d-Amphetamine daily, or a placebo, for a three-month period. Speech defect types were: Stuttering, immature production, oral inaccuracy, lisp, psychotic, mongoloid, aphasia, deafness, and cleft palate. Only the stutterers showed obvious improvement in comparison with the placebo group. Three severe, long-term stutterers showed such dramatic improvement that their whole course in life has been changed.**

THE STUDY here reported on the effect of amphetamines on speech defects is a resultant of the personal experience of one of the authors who, while taking Dextroamphetamine (Dexedrine®) for weight control in 1957, noticed a dramatic reduction in his stuttering. A review of the literature revealed that Ginn and Hohman in 1953, using dextroamphetamine for behavior problems in children, noted that the speech of two of four stutterers showed improvement. A short term pilot trial of dextroamphetamine in 1958 at Sonoma State Hospital on five mildly retarded patients who stuttered resulted in some improvement in all five cases. From these observations, dextroamphetamine seemed to merit further investigation as a possible agent in the treatment of stuttering. Because of the various concurrent and possible contracurrent psychological factors involved, a double blind study was undertaken. Patients with other speech defects were included in the study, for exploratory reasons as well as to disguise the fact that the principal objective was the study of stutterers.

MATERIALS AND METHODS

Dexedrine® (15 mg.) spansules and identical placebos were supplied in capsule form labeled A, B, C, and D. None of the participants of the investigation had knowledge of the code. Insofar as possible, the A, B, C, and D capsules were divided equally among the various speech types selected. A hundred and six patients, 53 males and 53 females, who ranged in age from 10 to 65 were selected. Twenty-two were stutterers, 16 had immature production of speech, 21 had oral inaccuracy, six had a lisp, 11 had psychotic speech, 15 had brain damage speech, seven had mongoloid speech, seven had aphasia or deafness, and one had cleft palate speech. Patients were given one spansule daily in the morning without being informed of the nature of the treatment. Treatment was continued for three months. Tape recordings of speech were made before and after treatment. Observations were made regarding side reactions such as behavior, change in weight and psychotic disturbances. A final general impression of speech improvement or no speech improvement was made based on combined observation by ward personnel, a speech therapist and the director of the project. Patients who showed improvement after three months were given treatment for another three months.

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RESULTS

Table 1 shows that the results for the group as a whole, all the various kinds of speech defects included, the therapeutic effects of the placebo equalled the effects of Dexedrine.® However, as to results in specific groups, five of 11 stutterers who received Dexedrine® showed improvement, whereas only one of eleven receiving the placebo was improved. Further analysis of the stutterers receiving Dexedrine® did not reveal any significant difference in age, sex or intelligence quotient between those

TABLE 1.—*Comparison of Dextroamphetamine (Dexedrine®) and Placebo Effect on Speech Defects*

	Dexedrine®		Placebo	
Types of Speech	Improved	Not Improved	Improved	Not Improved
1. Stutterer	5	6	1	10
2. Immature production	3	7	3	3
3. Oral inaccuracy	2	8	2	9
4. Lisp	0	3	0	3
5. Psychotic	0	4	1	5
6. Brain damage	2	3	4	4
7. Mongoloid	0	1	0	4
8. Aphasia and deafness	2	2	2	1
9. Cleft palate	0	0	1	0
	14	34	14	39
Treatment not completed because of side effect	0	5	0	0
	14	39	14	39

TABLE 2.—*Stutterers Who Received Dextroamphetamine (Dexedrine®)*

Patient No.	Age	Sex	Intelligence Quotient	Degree of Stutter	Results
Speech Improvement					
1	38	M	34	Severe	Dramatic improvement by controlling of stutter
2*	60	M	95	Severe	
3	36	M	54	Severe	
4	17	F	44	Mild	No stuttering
5	11	M	48	Mild	
6	40	F	52	Severe	
7	30	M	33	Severe	
8	31	M	74	Severe	
9	31	M	37	Severe	
10	54	M	33	Severe	
11	35	M	54	Moderate	

*I.Q. before treatment 59; after treatment, 95.

who improved and those who did not. Two of the patients with severe stuttering who did not improve were mongoloids. (See Table 2.)

Five patients receiving Dexedrine® experienced adverse side effects: In one, psychotic disturbances increased; in two, athetosis increased; and two had excessive loss of weight.

It was noted that the three stutterers who improved dramatically did so by controlling their stuttering so that it was not observable. Patients showing improvement continued to receive Dexedrine®; those who did not show improvement were given another amphetamine, benzphetamine (Didrex®-Upjohn) 50 mgm. b.i.d. After three months of administration of Didrex®, no improvement was evident in them, but two mild stutterers who had not previously received Dexedrine showed considerable improvement with Didrex®.

DISCUSSION

Even though the exact mechanism of the effect of Dexedrine® on stutterers was not a subject of this study, it was noted that in the three stutterers who had dramatic improvement, stuttering was not eradicated; it was controlled by the patient. It is quite probable that these three stutterers would have continued stuttering severely for the rest of their lives had not the various factors of this project intervened.

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ACKNOWLEDGMENT

The Dexedrine® spansules and the placebos used in this study were supplied by Smith, Kline & French Company.

REFERENCE

1. Ginn, Stephen A. and Hohman, Leslie B.: The use of d-Amphetamine in severe behavior problems in children, South. Med. J., 46:1124-1127, 1953.

Discussion by **RONALD R. KOEGLER, M.D., Los Angeles**

The paper by Dr. Fish and Mrs. Bowling is a very interesting study of a very interesting drug, amphetamine. This drug, in addition to its many other medical uses, has been found useful by investigators in the treatment of hyperkinetic impulse disorders in children. The original work on this was done by Bradley in 1941. Amphetamine was neglected in the burst of enthusiasm for tranquilizers in the 1950's, but it has now made a "comeback" and has assumed a respected position in therapy.

The foregoing paper brings to our attention a new possible use for amphetamine, the treatment of stuttering. Dr. Fish is to be commended for following up his own personal experience with an attempt to validate it in a scientific study. Discussion of the paper can be divided into two broad areas. (1) Does the evidence from the study indicate that amphetamine helps stuttering? And, (2) if so, what is the mechanism?

It would seem that the answer to the first question cannot be ascertained from the data presented. The impression here, upon glancing at the data, is that there is probably a significant difference between amphetamine and placebo. However, when the data is analyzed by Chi squared technique (using Yates' correction because of the small numbers), it may be seen that the results of this study could have occurred by chance in one out of six or seven attempts.

Yet there certainly is some *indication* from the data that *perhaps* it has some value, and I would recommend that the authors accumulate data on more cases. The greater the number of cases, the more significant any difference becomes. I would suggest that if this is done another stimulant control drug such as Ritalin® (methylphenidate hydrochloride) should be used in addition to the placebo. This is because it is my impression that it would not be too difficult to detect which of the patients in this study received amphetamine due to the side effects of the drug, such as increased activity, loss of weight and restlessness. This is borne out by the fact that in five patients amphetamine had to be discontinued because of side effects.

Still discussing the question of effectiveness of amphetamine, it would be helpful if the authors would describe in more detail the make-up of the stuttering group, both those receiving amphetamine and those the placebo. The data presented might have more meaning if we knew how many were mongoloids, how many had brain damage and other details.

Assuming for the moment, however, that perhaps amphetamine does have some effect on stuttering, we still have to answer the second question: Why? Is it because of some specific effect of amphetamine on stuttering or because amphetamine brings about

general improvement which includes the symptom of stuttering. This could be determined by assessing general clinical improvement in the patient as well as stuttering and such an appraisal would require more careful analysis of the clinical changes. Also, if Ritalin® had been used as a control in addition to the placebo, it might have been possible to speculate more accurately on the specific effects of amphetamine.

It is interesting in this regard to refer to the work of Laufer on the photo-Metrazol threshold as it is effected by amphetamine in children. It was his feeling that the effect of amphetamine in raising this threshold was due to its effect on the diencephalon, particularly the reticular activating system as described by Magoun. I would suspect that any effect of amphetamine on stuttering of these children would be in the nature of a general improvement in their condition through this mechanism, and not a primary effect on the stuttering.

Finally, although this explained results in the children, it does not explain Dr. Fish's own dramatic improvement. One can speculate that he was so happy by the loss of weight that his general mental outlook improved and along with it his stuttering. I am also curious as to whether Dr. Fish is still taking amphetamine and whether he would recommend that lifetime daily doses of amphetamine be prescribed for stutterers, as insulin is for persons with diabetes.

* * *

DR. FISH: Improvement was maintained after Dexedrine was discontinued. One patient needs an occasional Dexedrine spansule. There is no apparent need for life-time daily doses.